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This Framework contract main objective is to provide the electrical feedthroughs used as part of the nuclear confinement barrier for the LEVI system.

The LEVI (Loom Electrical Vacuum Interfaces) is the electrical system which provides the electrical signal and power to the in-vessel components of the diagnostic port plug (PP). It consists of several electrical components and mechanical parts:

- LEF (LEVI Electrical Feedthrough) which transmits the electric line across the vacuum boundary and the safety confinement barrier
- Diagnostics Shield Module (DSM) connector which provides the electrical junction between the DSM and the PP closure plate
- Front-End (FE) connector which provides the cable connection from the DSM to the diagnostic component installed in the DSM.
- Cables: due to the harsh environment (Ultra-High Vacuum, high temperature, high neutron/gamma fluence, strong magnetic field), MI (Mineral Insulated) cables are used except for some Kapton Cables on the PP closure plate.

Figure 1 LEVI layout in the diagnostic port plug

The LEF is a safety important component (SIC) to provide the nuclear safety confinement for radioactive products or toxic material (Tritium, activated dust, Be). It also forms the primary ultra-high vacuum boundary for the tokamak machine. To meet this requirement, the LEF has two confinement barrier.

The LEF is composed of following four sub-assemblies:

LEF Sub-Assembly.

Mating Flange Sub-Assembly.

IVS (In Vacuum Support) Sub-Assembly. Air Flange Sub-Assembly.

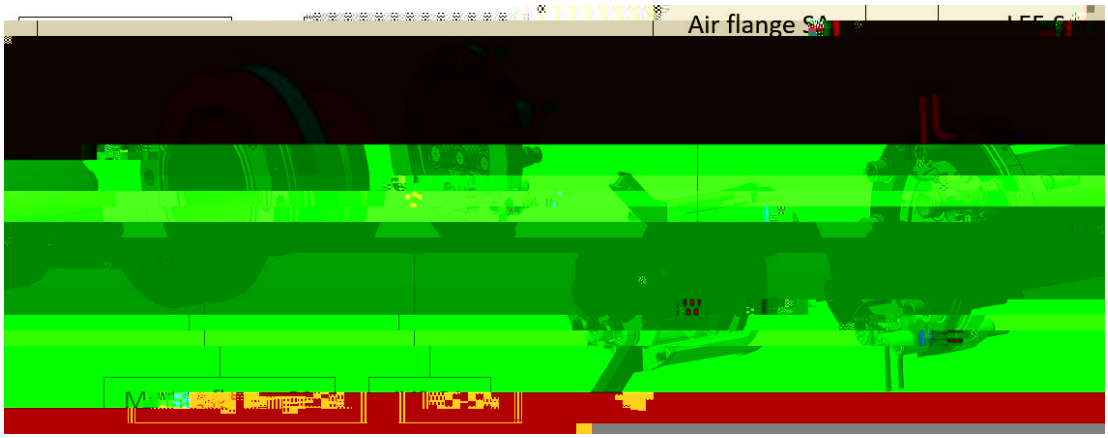

Figure 2 LEF assembly

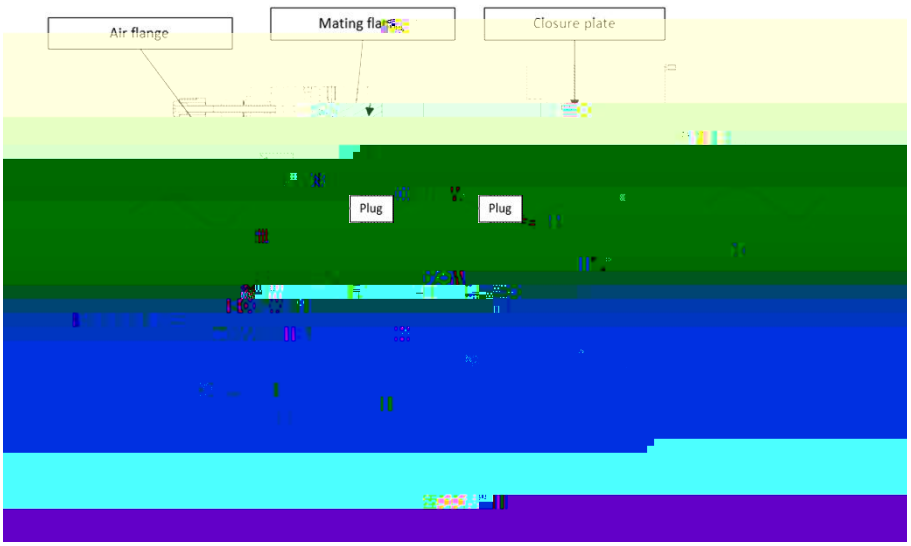

Figure 3 LEF concept (Cut View)

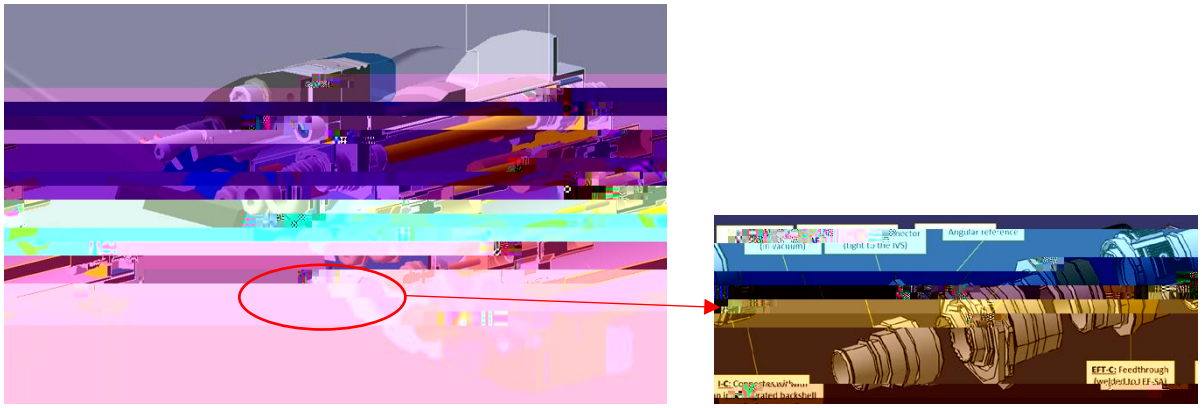

Figure 4 An example of the LEF design integrated with multi-pin feedthroughs and connectors (left) and the detail view for the assembly of a multi-pin feedthrough and two connectors (receptacle and plug)

Between each sub-assembly, some connectors accommodate the electrical junctions to provide the electrical services.

The LEF is designed to be replaceable during ITER lifetime. Therefore the connectors (òreceptacleó) between the LEFõs back flange and the IVS are compatible with blind mating. The connectors between the air flange and the LEFõs vacuum flange are also compatible with blind mating. On the other hand, the connectors (òplugó) within the interspace are joined with a threaded nut.

The scope of work covered in this Summary is to:

1. Provide the electrical feedthroughs used as part of the nuclear confinement barrier for the LEVI system.
    a. QA compliance with nuclear safety standards
    b. Functional qualification based either in documentation/testing of feedthroughs compliant with ITER environment and requirements
    c. Manufacturing and FAT of electrical feedthroughs and itõs connectors (EFT ðC and connectors highlighted in and)
    d. Documentation to allow traceability for manufacturing of Safety Important Components

As a general statement, the details of the task to be provided by the awarded Contractor will be defined in the Task Order Technical Specification

These Technical Specifications will be defined specifically for each Task Order depending on the actual requirement and will include a technical scope, the organization of the Task Order within IO and a description of the deliverables.

The LEVI system must accommodate several signal types as required by different diagnostic systems, therefore the awarded contractor shall provide the connectorõs design (i.e hermetic electrical feedthrough connectors + connection plug) compatible with the ones listed in Table 2

A preliminary list of requirements for these electrical feedthroughs is listed below:

‡

The candidate shall have facilities and experience such that they can perform:

Manufacturing of Ultra High Vacuum Electrical feedthroughs and related technologies
- Glass to metal sealing
- Ceramic to metal sealing

Leak tightness measurements

Capability to perform electrical testing

High Precision machining

Quality control and technical control which can be applicable to the nuclear safety component

The contract will be carried out over an initial firm period of four (4) years and an optional period of two (2) years. The contract is scheduled to come into force in end of 2023.

Participation is open to all legal persons participating either individually or in a grouping (consortium) which is established in an ITER Member State. A legal person cannot participate individually or as a consortium partner in more than one application or tender. A consortium may be a permanent, legally-established grouping or a grouping, which has been constituted informally for a specific tender procedure.

All members of a consortium (i.e. the leader and all other members) are jointly and severally liable to the ITER Organization. The consortium cannot be modified later without the approval of the ITER Organization.

Legal entities belonging to the same legal grouping are allowed to participate separately if they are able to demonstrate independent technical and financial capacities. Bidders' (individual or consortium) must comply with the selection criteria. IO reserves the right to disregard duplicated references and may exclude such legal entities form the tender procedure.

The indicative Call for Tender milestones are:

Call for Nomination	Beginning of December 2022
Issuing of Prequalification Invitations	Beginning of February, 2023
Issuing of Call for Tender	Mid of May, 2023
Submission of Tenders	End of June, 2023
Award of Contract	End of September 2023

Further information on the ITER Organization procurement can be found at:

http://www.iter.org/org/team/adm/proc